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GALEN

AN ESSAY

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BY

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The following Essay was found in manuscript among the papers of the late Henry Tylden, after his death in 1892. It was written in moments of leisure, chiefly at Oxford. In what form he intended it to be published is uncertain. It now appears practically without alteration, and has been printed by his mother as a memorial for his friends.

GALEN.

AMONG the many things which make an author interesting is the power of combining in himself a variety of interest. There will always be something attractive in a man who, while he has one foot firmly planted in the world of science or philosophy, at the same time does not lose touch with the practical world. Our interest in the philosopher Kant is increased by knowing that he lectured upon fortification. Such a man, again, was Galen. To his professional brethren he appeared in the light of a physician who interested himself in philosophy; to his literary friends he appeared as a philosopher who had come to take up medicine.

We all of us like people to talk about themselves, when they have the right to do so. Galen

had this right, and, being a physician, he was compelled to use it. To a great many persons, again, no form of autobiography is so interesting as literary autobiography. Now this we have to perfection in Galen. He is driven, not by inclination, but by necessity, not only to allude frequently to his own works, but to write a set book upon his own books. But from a scientific and medical point of view, the works of Galen are of something more than historical interest. In every age it is true that the words of the wise are as goads, and there are portions of Galen which might still be read, even by medical men, with advantage.

The story of the first fifty years of Galen's life is told with sufficient fulness and accuracy in his own writings; the closing years of his life are shrouded in obscurity. His life divides itself into three or four main epochs. There is his childhood, spent chiefly in his home at Pergamos. His life as a student of philosophy, mathematics, and medicine, which began in his home, was continued in sundry of the more famous Greek cities, and wound up in Alexandria. There is his professional life, embracing four years of quiet success at home in Pergamos, followed by twenty or more

years of anxious notoriety in Rome. These years are interrupted by a single episode—his escape from Rome. Once more we find him comfortably established at Pergamos among his books; but he is forced from his retreat by the mandate of the Emperor Aurelius.

Galen was born in Pergamos in the year 131 A.D. One point of interest in connection with his native city is illustrated in his writings—its gladiatorial shows. M. Renan has remarked upon their significance when they occur in the cities of Asia Minor. They indicate a certain coarseness of culture, a tendency to assimilate the grosser elements of Roman civilization. They had a personal interest for Galen; they were the means, as we shall see, of starting him in practice.

Galen was singularly fortunate in his father Nicon, who seems to have combined professional ability with general culture, being at once architect, geometer, and savant. He was less fortunate in his mother, who was more quarrelsome than Xanthippe, and sometimes bit the female attendants.

He counts himself blessed in not being designed for a physician from the cradle. To this he owed

the advantage of a liberal education, which he prized all the more highly because he saw no clearer evidence of the intellectual decay which had set in in his day than the tendency to premature specialising. People take to medicine, he tells us, almost before they can read or write—long before they can reason. His introduction to philosophy must have begun very early—probably before the age of fifteen, and seems to have been sufficiently comprehensive. Of the sundry philosophers he studied, probably none left so lasting an influence upon him as Plato, to whom he frequently refers, and always with respect, coupling his name frequently with that of Hippocrates. The influence of Plato upon Galen's style is at once obvious. Some of his descriptions are mere adaptations from Plato; the portrait of the philosopher-doctor stranded in Rome is borrowed from Plato's philosopher in the sixth book of the *Republic*. Socrates on one occasion defends the Sophists. After all, society is the great sophist. In a similar spirit Galen defends doctors; society is the great quack. He copies the Socratic irony. He even borrows expressions from Plato; concerning which it may be remarked that they

do not rank among his most conspicuous literary successes. It is possible that Plato influenced even his method. If Plato was in some sense an eclectic, Galen was openly and avowedly one.

If literature and philosophy came to Galen as part of his education, he was guided to mathematics by a reflection of his own, which he made quite early in the philosophical lecture-room. He observed that while the different philosophers, Peripatetics, Stoics, and Platonists, contradicted each other in everything else, they all agreed in their praise of mathematics. He concluded that this science, at least, must be worth studying.

Galen, who hated early specialising, specialised at an age which to us seems young. At the age of seventeen he entered upon his medical career. He was prompted in this by a dream vouchsafed to his father. He believed in his divine call as firmly as Socrates believed in his demon, affording an example neither here nor elsewhere of the traditional alliance between medicine and atheism. He studied anatomy in his native city under Satyrus, a pupil of the famous Quintus. He makes favourable allusion to his old master—he knew his Hippocrates better than Quintus. His

studies took him to Smyrna, Corinth, and finally to Alexandria, the Vienna of the day. Here his medical education received its final touches. On his return to Pergamos he had not long to wait for employment. The Pontifex, whose duty it was to provide for the gladiatorial shows, paid him the compliment of appointing him attendant surgeon to the gladiators ; whose wounds he appears to have irrigated with a sort of wine. After spending four years in practice at Pergamos, his ambition took him to Rome. We now come to the most interesting part of his career. We can fix his arrival in Rome with approximate accuracy. It was, he tells us, at the beginning of the reign of the Emperor Marcus Aurelius, and his age would be about thirty-one. The first five years which followed his arrival in Rome witnessed his rise to a position of fame and importance. This was partly owing to the patronage of one of the chief literary circles in Rome. The influence of Marcus Aurelius shed a brief and passing after-glow upon the waning culture of his age. Galen dates the decay of culture from his own boyhood. When he arrived in Rome there were not many men there of real literary eminence. The writers

of the Silver Age had passed away. Galen's most brilliant contemporaries, Lucian, Dion Cassius, and Pausanias the traveller, lived away from Rome. To Sextus Empiricus he makes, I believe, only a brief allusion. The Roman savants who patronised Galen were, many of them, persons of influence as well as culture. One of them, Flavius Boettus, afterwards went out as governor to Palestine Syria, where he died. Another, Alexander of Damascus, was professor of Peripatetic Philosophy in Athens; while a third, Sergius Paullus, was prefect of the city. These persons patronised Galen's public demonstrations in anatomy, and carried the news of his medical triumphs to the ears of the Emperor himself. They professed to see in Galen a man who was a skilful physician only because he was a born philosopher.

During the first two years of his life in Rome Galen came before the public in two capacities, as a public demonstrator of anatomy, and as a practitioner. His demonstrations were fashionably attended. Many of his views on anatomy were new; these he supported by evidence derived directly from dissection. He challenged the

opinion of the older anatomists, laying their books on his table. His lectures provoked discussion sometimes of a friendly, often, however, of an acrimonious nature. He got tired of them, he tells us, three years before he left Rome for the first time, finding in practice a sphere more congenial to him. He is not the only member of his profession who for one reason or another has abandoned the pursuit of science for practice.

A record of his most conspicuous medical triumphs is to be found in the book on Prognosis, addressed to Piso. As they all of them occurred in "fashionable practice," the attention of Roman society as well as of the medical profession was drawn to them. For in those days people occasionally did things on a more handsome scale than they do at present. Thus Boettus, when his wife fell ill, was not content with the advice of one consultant; he called them all together; and, to judge by what we read in Galen, a pretty pandemonium it must have been. From among the stupidities of the Roman physicians the light of Galen's diagnostic and prognostic genius shone forth. Here are some of the things he ranks among his most conspicuous successes.

He was called to see a Roman lady, who suffered from general malaise. He was able at once to exclude bodily disease, for there was neither fever nor was the pulse generally quickened. He saw clearly that her complaint was mental. He fell into conversation with her, and noticed that on mention of the name of a certain actor, Pylades, her pulse became hurried and irregular. He at once had his suspicions, but employed an ingenious method of verification. On subsequent visits he caused the names of other actors to be mentioned while his finger was on the pulse. The pulse remained unchanged, but on the mention of the name of Pylades it again became hurried and irregular. He concluded rightly that she was in love with Pylades. Could scientific diagnosis go further?

Another of his fashionable patients was the son of Boettus. The boy was ill and feverish at nights without any obvious reason. Galen put him upon low diet. The temperature still rose at nights; Galen concluded that the boy took food on the sly. This turned out to be the case. The history of the detection of the fraud is amusingly told. "That is a wonderful divination of yours," re-

marked the father, "which can detect hidden cakes."

His prognosis was as brilliant as his diagnosis. He was particularly successful in prognosing the crisis in fevers, a subject of which the ancients made a most elaborate study.

Sextus, the son of Antoninus, was down with some kind of intermittent fever. Galen foretold that if the crisis occurred on the sixth day a relapse might be expected; if on the seventh, none. The crisis came on the sixth day. Sextus accordingly got up and went about his business in spite of Galen's warning to the contrary. He rather hoped that Galen would be wrong. But Galen knew his ground. On the fourteenth day the relapse came, much to the annoyance of the Roman physicians. The final crisis came on the seventeenth day, as Galen had foretold.

The secret of Galen's success lay then not in patronage alone, but in his being a good physician of his time, and in his also being a man of great shrewdness. The news of his success reached the ears of the Emperor, and at length the last rung in the ladder of professional success was attained; he was called in one evening to see

the Emperor Marcus Aurelius for—we are sorry it was no more, but the truth must be told—a stomach-ache brought on by eating cheese. Galen was duly lodged in the palace, and duly called up in the night to see the Emperor, who was charmed with him, and dismissed him with the remark: "I have only one physician, and he is a gentleman." The jealousy of the Roman physicians became intense. They attributed his success to chance, to dreams, to divination. "Galenic divination" became a proverb in Rome, used in jest by his friends, in earnest by his enemies. His position at this time must have been a curious one—patronized by a powerful clique, hated by the medical profession, drawing large fees, abusing "the profession" to his heart's content. In this he was encouraged by his friends Boettus and Eudemus, who were even more spiteful in their insinuations against the Roman physicians of the day than Galen himself. Thus the reason of their congregating in Rome is supplied by Boettus—it wanted a Rome to hold them, their native cities being too small and too warm for them. On the same authority we are told that they are not above removing

a dangerous rival by poison. Galen himself casts frequent slurs upon their intelligence and education; many of them had taken to medicine before they could yet read or write. Elsewhere, he throws doubts on their mathematical proficiency; their frequent failures in the prognosis of fevers are due to their being puzzled to count the number of days. Many of them, not content with knowing neither their anatomy nor their Hippocrates, even boast of such ignorance. Galen must have given frequent and deep offence. He appears to have played upon two rather discordant strings. On the one side we hear of the grandeur and complexity of medicine, its kinship to philosophy. This is the note he strikes in a discourse conceived in a truly Socratic spirit, whose subject is that the good philosopher is also the good physician. This he reserved for the ears of the literary clique which patronized him. But he sometimes strikes quite a different note. Then medicine is said to be quite a simple thing; a thing whoso runs may read; the only necessary preliminaries thereto being a knowledge of anatomy, a study of Hippocrates, and a few grains of common sense. This was bestowed

chiefly upon his professional brethren in consultation, where he usually had to set them right.

We all know that on occasions like this such a tone is inconceivably irritating. They did not conceal their hatred, and appear to have rendered his life at this time odious to him. He was quite in earnest in sighing for home, and practice in some smaller town, whose doctors are friendly and known to one another. It was at this time that he drew the picture of the philosopher-doctor in Rome, which we have already referred to as rather a close imitation of Plato's philosopher in the sixth book of the *Republic*. Both of them are compared to men sheltering from a storm under a wall. Plato's philosopher must be contented if he can save himself alone; if, after a clean life, he can make an honourable exit; for society he can do nothing. It must be allowed that the philosopher-doctor conceived of by Galen, and realized in his own person, manages his affairs somewhat better. He contributes by his art something towards the good of society, and makes his exit with a high reputation and a full purse. Four hundred aurei was the fee which Galen received for attending

the wife of Boettus for a period not longer than a fortnight.

It appears that Galen frequently spoke to his friends of retiring from Rome; perhaps he threatened to do so publicly. But no one believed in these threats, not even his friends. "No one will believe you," said his friend Eudemus, on one occasion. However, at length he determined to show them that he was as good as his word, and in the year 168 A.D., in the thirty-seventh year of his age, he escaped from Rome suddenly. He got well out of the city before anyone was aware of his flight, leaving a slave injunctions to sell his furniture. We find him first in Campania, then at a town Cassiope, in Corcyra, and finally established once more in his home at Pergamos, reunited to his books. Here he would have remained, in all probability, to the end of his life, but an Imperial summons called him back to Rome within a year of his departure. It was an eventful moment. Aurelius and Verus were starting to invade Germany; there was a great demand for "working and not mere talking doctors;" Aurelius determined to take Galen with him. His head-quarters lay at Aquileia. Just at

this time L. Verus died, and Aurelius returned to the capital, taking Galen with him. Galen begged hard to be left behind, pleading his greater usefulness at home. Aurelius knew how to yield gracefully. After worshipping the god Æsculapius, by whose providence Galen had once recovered from an abscess, he departed for Germany, having first consigned the youthful Commodus to Galen's charge. From this point our chronology fails us. We know that for some time he lived as little in the capital itself as he could. We know also that now began a period of great literary activity for Galen. But how long he stayed at Rome, whether he died there or no, how long he lived—this is more than we know. Certain passages in his writings throw light upon this part of his career. I know three such passages. The first is an allusion to a fire in which the temple of Vesta was burned; Galen himself suffered losses in it. This fire occurred, I believe, in the reign of Commodus, from which it may be inferred that Galen was still in Rome then. Another passage mentions certain discussions among professors of medical sects in the reign of Pertinax. As Galen addressed a book

to some of the disputants, we may infer his presence in Rome under Pertinax. Lastly, we have an account of a trip to Lemnos, which Galen undertook on his way home. He, therefore, at any rate, visited his home after his return to Rome.

Such, then, in very brief outline, is the life of Galen. There are certain episodes in it of which mention has not yet been made. These are his travels. Even in our own day we meet here and there with physicians in great practice, who retain scientific interest enough to start off in their holidays on travels for scientific objects, either to work, or to watch some work going on, in Berlin or Vienna, in Lyons or Paris. So it was with Galen. He goes to Lemnos to see the famous Lemnian seals, which he afterwards used for medical purposes; to the coasts of the Dead Sea and to Palestine, not, indeed, for that purpose for which myth afterwards took him, to convince himself of the truth of the miracles of Christ, but to view certain flat bituminous stones. We also find him in Crete. His trip to Lemnos is of literary and topographical interest enough to merit some further notice. He seems to have

known less of Lemnos and its doings than we should have expected, considering the nearness of that island to his native city Pergamos. Wishing to see the making of the famous Lemnian seals by the priestess, he took Lemnos on his way back to Rome, on the occasion of his recall by Aurelius. Sailing from Alexandria in the Troad, he arrived at Lemnos. Arguing from the analogy of other Ægean islands, he expected to find a single centre in the island with the temples of Hephaestias and Philoctetes near at hand. In this he was disappointed. The chief port, Myrina, lay on the east of the island, while Hephaestias, the object of his visit, lay away to the west. The captain could not wait, and Galen had to continue his journey to Rome disappointed. But he was not to be beaten. On a subsequent occasion he took Lemnos again on his way back to Pergamos, found his way to Hephaestias, and witnessed the ceremony of making the seals. He had heard that the priestess used the blood of goats, mixing it with earth; but this turned out to be a mistake; the seals were made of earth alone. Galen seems to have employed them subse-

quently in hæmorrhages and ulcers. It was here that, forgetful of the precepts of his master, the Platonic Socrates, given in the *Phædrus*, he attempted a somewhat rude rationalisation of the myth of Hephaestus. The story ran that on a time Hephaestus had the unwisdom to interfere in a domestic difference between Zeus and Hera, and was further indiscreet enough to espouse the weaker cause. Zeus took him by the leg and hurled him from heaven. He alighted on a hill in Lemnos, which became the chief centre of the worship of Hephaestus. The arid and scorched appearance of the hill doubtless gave rise to the growth of the myth, remarks Galen drily.

Let us turn now to glance briefly at some of the main topics suggested by a perusal of the works of Galen.

First and foremost come his books. There are few subjects of greater interest to the student of Galen than this. The writings of many authors have no particular connection with their lives. In no author is literary activity more completely a function of the main life than in Galen. Again,

to write a book is hardly a distinction; but even in our day there are few people who write a book on their own books. Such a procedure could in the ordinary course of things have neither place nor meaning; but in the case of Galen it was a necessity, which arose on this wise.

One day, during his first sojourn at Rome, Galen found himself standing in the Sandaliarium before a bookseller's stall. Some people were handling the books. One of them was about to buy a work which he believed to be Galen's. A savant took it from him, and, after reading two lines of the inscription, put it down with the remark: "This cannot be Galen's." "The man who said this," continues Galen, "was one who had been brought up on grammar and rhetoric in the old style, before men were foolish enough to specialize ere they could read." Now this was only one example of many; there were numerous spurious works of Galen already scattered about the world before he was forty years old.

The leading motive, then, which inspired the 'Book on his own Books' was not the desire to talk about himself, but the wish to place on record as far as possible a complete list of his own

genuine works. The work is of great critical value, affording, as it does, a positive criterion, though not a negative criterion, of the genuineness of Galen's works. The mention of a book in the 'Book on the Books' is strong evidence of its being genuine; the omission, on the other hand, from that work is hardly decisive of its spuriousness, when we remember that the work itself was largely compiled from memory.

How came the works of Galen to be in so unsatisfactory a condition? He himself supplies an answer to the question. Many of his books, especially the early works on anatomy, were simply copies of lectures given to friends at their request without any idea of their being published. Some he gave without either inscribing them or keeping copies of them. He was singularly careless in giving them away; if he gave one to a Boettus, he gave another, he tells us, to a midwife. Most of them were given to pupils, who, after taking their course, wanted a *ὑπόμνημα* of the lectures. This they would read to audiences in their own homes, the less scrupulous among them declaiming them as their own productions. Many of the recipients again did not hesitate to intro-

duce modifications of their own, or even to inscribe them with their own names. But in course of time the original recipients died, and the works passed into other hands. In spite of the foreign accretions by which they were overlaid many of them were discovered, and found their way back to Galen. Some were even brought to him for correction. But of some of the more elaborate of his earlier works, such as the book on Respiration intended for Boettus, he had kept copies. The same is true of the book on Erasistratus. Here the motive for elaboration had been a less creditable one. He admits that it was nothing else than 'animus' against an aged and acrimonious anatomist, Martialis by name, who called himself a disciple of Erasistratus. Galen criticised Erasistratus with unnecessary severity, and was further unkind enough to give the book to a young fellow-townsman of his rival to fire off against him.

Further, as Galen was learning all his life, his works represent very different degrees of maturity. The existence of discrepancies in his writings is a fact which he freely admits. The treatise on the 'Use of the different parts of the Body' is a long

and elaborate treatise. He tells us that in it he is handling, from a more advanced standpoint, topics already handled before in earlier treatises.

The three main causes then of the unsatisfactory condition of Galen's works were :—(1) the original imperfection of form in works intended only for beginners ; (2) discrepancies arising from wanton addition and mutilation ; for these Galen was in no sense responsible ; (3) discrepancies which reflect the different phases of the growth of his own knowledge.

What a curious condition of things ! Here we have a man who has become a voluminous author in spite of himself, and long before he intended to be—a writer whose books are discovered for him during his own lifetime, who looks on at people busy discussing the authenticity of his own books, who has his own books brought back to him to be owned and corrected.

Nor were these the only difficulties with which Galen had to contend as an author. He had left many of his own books behind him at Pergamos when he came to Rome, amongst them his commentaries on Hippocrates. This caused him to lead a sort of divided literary existence.

One of his logical treatises was stolen by a servant during his absence; he came upon it subsequently one day in Pergamos. Then he suffered severely in the fire in which the temple of Vesta was burned in the reign of Commodus. Many of his philosophical treatises perished.

Let us pass on to another topic. The works of Galen throw abundant light upon the history and pursuit of medicine in the Greek and Graeco-Roman world. How medicine came to be what it was in Galen's day, the methods of research open to students at the time, the schools of medicine, the favourite teachers of anatomy, the Roman savants of the day, their manners and resorts, medical rivalries great and small, broad differences on scientific and philosophical subjects, little obscure local jealousies, such as that which Galen alludes to as existing between the physicians of Alexandria and Crete—all are illustrated in the works of Galen.

Medicine, Galen tells us, was once a very different thing from what it is now. Its pursuit began in the guild of the Asclepiadæ. At first the number of medical students would be very limited.

There was in these early days a close and vigorous supervision, which embraced not only educational but moral matters as well, as can be seen from the terms of the famous Hippocratic oath. In such a state of things there was no need of public demonstrations in anatomy, still less of anatomical books. For the student grew into an anatomist, and then into a surgeon, under the eyes of the master. Galen looks regretfully back upon this as a sort of golden age of medicine. We are reminded of the Platonic Socrates, who thought the living teacher so much better than the dead book. The golden age of medicine in Greece ended with the rise of sects. And now the love of many towards the study of anatomy began to wax cold; so "for the hardness of their hearts" anatomical treatises were given them, but not at first in the form of pure anatomical treatises. The earliest works, Galen tells us, were a mixture of anatomy and medicine. They must have borne a resemblance to some of the works of modern specialists, who often find it necessary to preface a medical or surgical treatise with the anatomy and physiology of the organs concerned. This is copied from text-books, but the copyist asserts his

independence by the grandeur and beauty of his diagrams. But in course of time anatomy came to be differentiated as a distinct branch. The earliest treatise was by an author of the name of Marinus, upon whom Galen bestows the praise that his work was timely. Two other manuals were in existence in Galen's days, conceived for the most part on the lines of Marinus. But of anatomists contemporary with Galen Lycus was the chief. Public opinion on one occasion bore testimony to this in a remarkable way. Galen had offered to confute the opinions of all previous anatomists upon certain disputed points. He was requested to confine his attention to Lycus alone, as being a worthy exponent of anatomy up to date. But the works of Lycus were themselves faulty, containing many mistakes both of omission and commission. And the anatomical works in existence in Galen's time abounded in discrepancies, not all of them by any means the result of error, but incidental to the growth and progress of anatomy itself as a science. How natural this is will appear on a moment's reflection. Here, as elsewhere, we are reminded of the truth of M. Comte's famous dictum, "The older the world

grows, the more the living are indebted to the dead." Every successive generation takes more for granted than the preceding one. And so it is in the science of anatomy. We find our different structures distinguished and named ; we forget the enormous labour at the expense of which this was achieved. We are aware that things have somehow shifted into their places, but how, God knows! In illustration of this, we need do no more than allude to a single topic discussed at length by Galen. What constitutes the unity of a muscle? Or upon what ground does the systematisation of the muscles in anatomy rest? On discreteness (or the existence of a single origin of insertion) or on unity of function? When are we justified in speaking of two bundles of muscular fibres as different muscles? when in regarding them as parts of the same muscle?

It would not be interesting to pursue this matter further here. I need only remark that, as a fact, our present systematisation rests upon no single principle, but upon several principles, in which convenience and compromise play a large part. In Galen's day anatomists were feeling their way towards system. Discrepancies were an unavoid-

able necessity; in most cases opposite views had each of them something to recommend them. One part of Galen's work, therefore, was systematisation.

But the imperfections of previous workers left plenty of room for discovery as well. These, again, were unavoidable; they were due to the limited methods of investigation open to students at that time. It will be interesting to see what these were. Human dissection seems to have been little, if at all, practised. The resources at the disposal of the anatomical student were, however, considerable. Galen's advice to medical students is, if possible, to go to Alexandria. Alexandria was the Vienna of the ancient medical world. It was particularly famous for its course in osteology, which seems to have been combined with naked eye pathology. They demonstrated the anatomy of the bones as far as possible at the *post-mortems*. It seems rather droll to us to find medical students sent abroad to learn their osteology. But it is not everybody who can afford to go to Alexandria. And for those who could not there were good things in store nearer home, partly in the form of occasional blessings, partly in that of regular dispensations.

Such occasional blessings had fallen to the lot of Galen himself.

On one occasion, he tells us, he was walking along a mountain path. A little to the side of the road lay a carcase well-nigh stripped of its flesh. It was the corpse of a robber, who had been killed in his attempted robbery, and abandoned by the natives. The birds had in a manner performed the work which the dissecting-room porter sometimes does for the modern demonstrator. It was a splendid subject for the study of osteology.

On another occasion, he was walking by the bank of a torrent. The force of the torrent had carried a dead body down, and deposited it high and dry upon a sort of dam. The flesh had mouldered, and nature had prepared a subject suitable for osteological investigation.

But a large remnant would still remain of students too poor to go to Alexandria, and not blessed with these chance luxuries. These would have to fall back upon apes. Galen gives them advice on the variety of ape to choose, in terms which show that he neglected no opportunity of studying comparative anatomy. It was by the

dissection of apes that Galen made his own most important anatomical discoveries. He discovered new muscles, he gave the first correct description of old ones, simply by employing additional care in dissection. For example, he killed his apes, he tells us, by drowning them, in order to avoid wounding their necks; more important still, he skinned his apes himself. Previous dissectors had allowed the laboratory assistant to do this for them. So late in the day the dissector arrived on the scene. The muscles which have superficial attachments in the fasciæ had been severed in the process of skinning, and the parts dried by exposure. The dissectors pulled up the distal fragment of the muscle and made a guess at its function. In this way the merits of the 'plantaris' and 'palmaris longus' had been overlooked, and the muscles of the expression too had had scanty justice done them. All of which points Galen set in their true light.

If he was a considerable discoverer in the field of anatomy, he is no less sound in his views on the general bearings of that science. Anatomy, he thinks, may be studied from four different standpoints, according as it has four different

interests. It may be studied simply as anatomy and nothing more. Then there is the biological standpoint, where structure is studied in relation to function. Next there is the practical standpoint. This concerns the surgeon. And lastly, the philosophical or teleological. These four interests dwell in great measure apart from one another. I remember an amusing example of the combination of the first and fourth of them in a modern handbook of great excellence. A description of the anatomy of the eye is given in the text, which leaves nothing to be desired, while the teleological view is upheld in a note, where reference is made to a passage in Xenophon's *Memorabilia*, in which Socrates likens the eye-brows to eaves, and thinks that Providence put them there to prevent the sweat trickling down into the eyes. It is not always possible to be instructive and edifying at the same time.

Galen bases his surgery on anatomy, whilst his opponents, the Methodicists, as they were called, the upholders of that fortuitous method of learning anatomy which he so justly derides, based their anatomy on surgery.

He states his own views upon practical anatomy

with something of a bias against the study of internal anatomy, a fault which is, however, quite on the right side, when we remember how much more immediate was the future of surgery than of medicine.

The urgency with which he insists on a methodical study of anatomy would appear commonplace to modern ears, but was no truism, however, in his day. One important school, that of the Methodicists, held that this study was a superfluity, that anatomy could be conveniently picked up at surgical operations. On one occasion Galen had a chance of bringing these two conflicting views to a practical issue. When he was practising in Pergamos, an outbreak of anthrax occurred, which, whatever its precise nature was, involved deep ulceration. The pupils of Satyrus, his own master, were able to turn the occasion to advantage. By careful and delicate manipulations they were able to demonstrate to their own satisfaction the function of muscles and the course of vessels and nerves. It was quite otherwise with those who had picked up their anatomy upon the Methodicist plan. They put the patients to considerable pain, and saw nothing.

The physiological contributions of Galen might appear on a casual survey to resemble the basket of figs shown to the prophet Jeremiah ; those of them that are good are very good, those that are evil very evil. No doubt his works abound in physiological errors which to us appear strange enough. On further perusal, however, we shall be inclined rather to admire him for what he knows than to blame him for what he does not know.

That part of physiology which lent itself to the methods of investigation open to him is often exceedingly ably handled ; while the regions which it was impossible for the lamp of research to explore are often lit up by flashes of real insight.

A good example of the first kind is his description of the physiology of digestion. The physiological outline of digestion in the stomach is well described. Galen knows the minute anatomy of the stomach about as well as it can be known without a microscope. He describes its nerve-supply accurately enough. The structural differences in the various parts of the digestive canal, the different vascularity, he interprets

in the light of their different functions, and his interpretation leaves little to be desired.

Later on he loses his way in the portal system. His idea that the portal blood leaves two elements behind it on its way to the liver, one in the spleen, the other in the gall bladder, is curious enough. It is curious that he should have missed the pretty obvious fact that bile is manufactured in the liver, especially as Erasistratus had already entertained that idea.

For an example of the second kind we may turn to his account of the circulation of the blood. His views in this direction were the result of inference rather than observation. There is an idea widely prevalent even among medical men that the "ancients" knew nothing of the circulation of the blood, and that the entire group of facts which are summed up by that expression were the discovery of the illustrious Harvey. When a person is told without reservation that Harvey was the discoverer of the circulation of the blood, this is the interpretation he would naturally put upon the words. Even text-books on physiology, when they deal with the topic, employ language which stands in danger of being seriously mis-

understood; the error lying not so much perhaps in what they say, as in what they leave unsaid. It would be wiser perhaps if they passed over the question altogether.

So far from knowing nothing about the circulation of the blood, Galen was within an ace of understanding it. The structure and function of the several valves of the heart, their condition in systole and diastole, the course of the circulation from the veins into the right side of the heart, the anastomosis between the arteries and veins—all this is well understood by Galen. There are no doubt several blots on his account of the circulation. Perhaps the chief one is the idea that air travels from the lungs by the pulmonary veins to the left side of the heart; an event which we now know would prove a most fatal catastrophe. I am not certain as to the exact sense in which Galen meant his words to be understood, whether he meant that air alone, or blood and air, passed in the direction indicated. Certainly he criticises the notion prevalent among many ancient physicians that the arteries contain air alone, finding himself that they contained air and blood.

Another error in his account of the circulation is the admission of a constant reflux through the mitral valve. What we recognise to-day as a morbid condition he regarded as a normal occurrence, and deduced it from the structure of the mitral valve. His notion that nutrition is chiefly carried on by the veins, though a physiological error of some importance, does not concern his theory of the circulation. The truth is therefore that the ancient world did not fail to understand the circulation of the blood as a whole ; it was only one portion of it that puzzled them—the pulmonary circulation, though how far Galen himself failed in this is a matter not very easy to determine.

I have heard it said that the one thing which retarded the progress of ancient physiology was the ignorance about the circulation of the blood. This is far from being the truth. There were sundry things which retarded it far more. One is that, in the absence of the proper chemical standpoint, the work of chemistry is undertaken by a sort of rude physics. As, for example, in the instance just quoted. We say the blood undergoes chemical changes in the lungs ; Galen, that the lungs send the heart air.

Another is the absence of the proper physiological standpoint, and of the idea of a cellular basis of animal life. Considering its absence, the approximations which Galen makes to the modern conceptions of "assimilation" and "repair" are rather remarkable.

The notion of the selective power of the different glands is an idea familiar to him. That this power lies in the cells of the gland he does not say, but he goes as near as he can to saying it; it lies in the fleshy part of the gland, or in the specific part of it. Then the power an organ has of building itself up out of materials brought to it by the blood is equally familiar to him. The sojourn in a part, he says, makes the blood like that part. It is only when we go a step farther, and inquire into the processes which underlie assimilation and repair, that the gulf which separates ancient and modern scientific thought comes into view.

Then we see once more a physics often of a somewhat rude kind undertaking the work of chemistry and physiology. For example, Galen conceives the changes by which blood is converted into liver-tissue in a purely mechanical

way. There is, he thinks, a half-way step, where the blood undergoes a sort of congelation. In the absence of chemical or physiological conceptions he has to fall back upon physical ideas.

One thing which will at once strike the student of Galen is the free use he makes of teleological conceptions. It is not my intention to deal with the important subject of the relations of teleology to science; I will confine myself to a few simple observations. It would be quite untrue to say that the methods of Galen and of modern science differ from one another in this, that while the one employs teleology, the other eschews it. Both of them employ it, and employ it freely. There are no such bitter opponents of teleology as scientists, while at the same time there are no books more full of teleological ideas than their own. But their teleology is not quite of the old sort. Galen's teleology starts from the idea that everything was created from the outset in the highest possible state of perfection. In this way the idea of progressive development is excluded; there is no room for evolution. It cannot be said, again, that the belief in the intelligibility of the universe, to which Galen in common with his master Plato so

firmly held, differentiates him from modern science. For, as Lotze truly remarks, the discovery of a meaning in phenomena, a rational interpretation of events, is everywhere reckoned among the highest achievements of science. He differs from us only in the confidence and buoyancy with which he goes to work. Galen is a Greek, and the Greeks, as the Egyptian priests told Herodotus, are young. They speculate like intelligent children. If their speculations have the charm of youth, they have also its immaturity. Clever guess-work does duty for careful investigation. This defect meets us everywhere in Galen. He has a reason ready for almost everything, even for the position of the different organs. If the mitral valve has only two cusps, he must account for this as for everything else; but to do so he assumes erroneous data. But this only means after all that he is in too great a hurry to give an account of things.

The medical world in which Galen lived and thought presented many sharp contrasts with the one familiar to ourselves. He would be thought a droll physician to-day who imagined that medicine had anything to do with philosophy.

It was different in Galen's time. "O Athenian stranger," says Cleinias the Cretan, in the *Laws* of Plato, "for inhabitant of Attica I cannot call you, you seem to me to deserve rather to be named after the goddess Athene, for you carry the argument back to first principles." What was true of the Athenian was equally true of all Greek thought whatsoever; and we may apply with our own modification the famous dictum of Sir W. Hamilton, "Few difficulties emerged in Greek physic which had not already emerged in Greek philosophy." So many of the great medical controversies of Galen's day had their roots in metaphysics. How many of them play around the great metaphysical difficulty of the conception of change! How numerous were the attempts to apply the principles of the older atomists to interpret pathology! We must not therefore be surprised to find Plato and Aristotle treated as great medical luminaries. Plato is a zealous disciple of Hippocrates, and their two names are reverentially coupled together.

Unlike the medical world of to-day, the physicians of Galen's time were broken up into various sects. There were many watchwords and many

masters. Men were in the first place sectaries, and only in the second physicians. Those who did not range themselves under some abstract principle, such as Rationalism, Empiricism, or Methodicism, called themselves by the name of some master. They were followers of Hippocrates or of Erasistratus. In this Galen saw nothing but evil. "Call no man master" was his motto. He was no servile follower, even of Hippocrates himself, though he frequently alludes to him with becoming reverence: "Hippocrates, our guide to all that is good;" "Hippocrates, who wrote nothing ill;" "With Hippocrates I will start, as with the voice of a god." Yet he held it slavish to belong to a sect, and his attitude towards the other great masters was even freer still.

The three most important medical sects in Galen's day were the Rationalists, the Empiricists, and the Methodicists. The conflict between the first two still went on in Galen's time. We read that on one occasion two masters, Pelops and Philippus by name, wrangled in the theatre at Rhodes for two days. But probably it had lost some of its keenness since the time of Celsus.

Certainly this is the case so far as Galen himself was concerned. His own position may be thus briefly summed up. He was an eclectic with strong Rationalist leanings, and an equally strong bias against Methodicism. Two things contributed to make him take a lenient view of Empiricism. In the first place, he admitted Empiricism to some extent into his own system. He was, in fact, what most unsophisticated physicians are, a Rationalist whenever he could be, an Empiricist when he could not be a Rationalist. The controversy in the form in which it is usually raised is indeed far from being a profound one. We feel at once that we are in pretty shallow water. Most people speedily make the discovery that they are both; people of a reflective turn of mind that they are both and neither. Nevertheless, the controversy has roots in metaphysics; it raises ultimately a number of questions which are anything but idle.

But there was another reason which made Galen look kindly upon Empiricism. It often happens that when practical and theoretical interests are both at stake, the practical take precedence of the theoretical. And so it was here.

Galen was, in this question at any rate, in the first place a physician, in the second a philosopher. He saw clearly that the quarrel with Empiricism concerned only the origins of medical knowledge. Are they to be laid in reason or experience? Sound medical practice is consistent with either answer. Medicine is a platform upon which Rationalist and Empiricist may conveniently meet.

It was far otherwise with the third sect, the so-called Methodicists. Methodicism was one of the later medical sects. Founded by Themison in the first century B.C., it had won ground in Rome in the century before Galen, chiefly through the teaching of Asclepiades, a physician who came there and made a considerable reputation. It is with him that Galen and his pupils chiefly deal. In the treatise on the 'Medical Sects,' the Methodicist, Empiricist, and Rationalist are introduced towards the end of the work, and made to occupy the platform successively for the space of about five, ten, and twenty minutes respectively. The Rationalist's turn comes last, and he has by far the longest innings of the three. What happens here is typical of what

happens elsewhere in the writings of Galen. The Empiricist and Rationalist make common cause against the unfortunate Methodicist. Let us glance briefly at the views of this remarkable sect.

We read much of their philosophical tenets, and of the practical deductions they made from them. Galen makes war on both. So far as their philosophy is concerned, they are identical with Democritus and Epicurus, and treated as though they were simply presenting the older atomic theories in the garb of a novel phraseology. They seem to have stopped short of thorough-going atomism in one respect — they admitted stringency and laxity as qualitative distinctions in matter. Otherwise they were mere revivalists of the older atomism. Many of the attacks made upon them by Galen and the disciples of Galen who wrote the treatise on the 'Theriace,' are nothing more than the stock arguments by which atomism is generally assailed. They are reproached with denying the existence of a rational φύσις, with attempting to construct a world out of senseless atoms, and so forth. But it does not need much penetration to see that their real fault lay not in their philosophy,

but in the practical inferences they drew from it. There was nothing particularly objectionable in their atomism. They had only to combine with it the idea of an empirical sequence of atomic states, and they might have proposed with advantage, as the object of pathological inquiry, the investigation of the successive atomic conditions which underlie the different phases of a disease. Such a view of things, no matter what its ultimate truth may be, would have guided medical inquiry in the right direction. It would have been preferable to Galen's own physical views. With this, however, they were not content. They conceived disease as an isolated atomic condition, which could be related neither to past nor yet to future conditions. Its whole history and reality lay in the moment — in this particular atomic condition. Each disease is a condition which has been produced at this moment; it has no relations. From this principle they deduced two things—the uselessness of the study of the aetiology of disease and of anatomy. Our business, they said, is with the disease, not with the conditions out of which it arose. Our business is, again, with the disease, and not with the

anatomy of the part, which may be neglected ; an ulcer and a boil are the same wherever they occur.

Here we see again how closely medicine is implicated with metaphysics. Their stumbling-block was not a pathological difficulty, but a metaphysical one ; it is the old difficulty of conceiving change which puzzles them, and they have not the wit to waive metaphysics and stick to pathology. They justly laid themselves open to the ridicule poured upon them by a pupil of Galen's in the treatise on the 'Theriace.' Supposing a man, argues the writer, is bitten by a mad dog ; his wound looks like any ordinary wound. The Methodicist says : My business is with the wound ; how it was produced I do not care. He treats it like an ordinary wound and the man dies. And the writer pities the condition of the hydrophobic patient who is luckless enough to fall into the hands of the Methodicist, who is only one degree less mad than the dog that bit him.

Enough has been said to show that the Methodicist was not merely a paradoxical reasoner, but a dangerous man. On this

account Galen was right in making war upon him.

The works of Galen are not by any means all of them readable, and still await perfect editing. We might select as fair samples of the more interesting among them the book on his own books, and the work on Prognosis addressed to Piso. The larger works, such as that on the 'Use of the Parts,' and the one upon 'Anatomical Proceedings,' are not to be read from cover to cover, but rather piecemeal. Even at the present day they are not without suggestiveness. The work upon the 'Theriace,' the famous ancient specific, is probably not Galen's. It is not mentioned in his 'Book on the Books'; but the exceedingly rough way in which the Methodicists are handled betrays the pupil's, and not the master's hand. The work is interesting, however, from more than one point of view. It adds to our knowledge of the sources of ancient research. The author refers to experiments upon condemned criminals, made apparently either by or by leave of the magistrates. We are reminded of what we read of in the French Court in the middle ages; there and elsewhere the practice was not uncommon. He also

mentions experiments made upon living animals —a species of wild cock. The experiments, as far as they went, were scientific enough. Some of the birds were made to drink the specific; they were then subjected to the bite of serpents. Those which had drunk took no harm; those which had not, died. The specific, too, is not without interest. The active principle in it seems to have been an extract from the bodies of adders, of which they made a sort of brew, mixing along with it some ten or twenty other ingredients, probably all of them inactive. Marcus Aurelius took this as a sort of daily tonic, and brought it into fashion. A great many people in Rome at that time seem to have lived in hourly fear of being poisoned by their friends. The people took it freely. It is difficult to believe that there was nothing whatever in it. No doubt the description of its properties reads very much like a quack advertisement; but the experiments alluded to were of so simple a nature, that anybody might have performed and interpreted them.

Galen, if not exactly a genius, is a man of great intellectual fertility, and of enormous

mental range, passing easily from medicine to physics, from physics to metaphysics. Once started on a discussion, he proceeds on no predetermined lines, but travels, like Socrates, "whithersoever the argument leads him." He is something more than a physician and a philosopher combined; he is a literary man as well. He is saturated with Plato, and copies him rather too exactly.

He would have made his mark as a physician in any age; not, indeed, on account of his speculative powers, nor of his originality; for these qualities, however valuable in themselves, can well be dispensed with by a physician; they may, perhaps, be a snare to him. But they were not so to Galen, because he combined with them a shrewd common sense, a term which we might, perhaps, define as the art of seeing at a glance the method appropriate to the subject matter in hand. He had all the requisites of a good physician — common sense, the power of using his wits, and the faculty of making a ready and plausible use of the stock of knowledge at his command. And we have seen how his "bedside manner" went straight to the heart of the Stoic

emperor. The kind of ability to which he owed the secret of his success in practice is well illustrated by the following occurrence related by himself, in which he gained great κῦδος among the Roman public, and incurred at the same time the odium of the Roman consultants. A patient lay ill with fever, and the doctors were about to bleed him. Galen agreed with them, for all the indications for bleeding were present, Galen's indications being much the same as those which would guide those physicians who still employ venesection at the present day. But he happened to look closely at the patient, and observed that the left nostril was extremely injected. He suggested, therefore, that it might be superfluous to do what nature was presently about to do herself; predicted hæmorrhage from the left nostril, and ordered a basin to be held in readiness. The other consultants laughed at the Galenic divination, but their merriment was speedily turned into chagrin when Galen's prediction was fulfilled. Here, as elsewhere, he succeeded by using his eyes. There was no doubt something of the adventurer in Galen, and more than a trace of conceit. He might have been an irritating person to meet in

consultation. He could also be sarcastic at times, and there are some fine Theophrastic touches scattered up and down his works. There is, for example, the "bookish" physician, who steals his case out of books; the "accomplished" physician, who abounds not only in medicine, but in other arts as well. It is told of a late physician of repute, that he possessed, among other accomplishments, the faculty of talking for half an hour about Schopenhauer without having read him. Galen was not an admirer of such versatility, or have we here an example of κεραμεὺς κεραμεῖ? Of such marvellous versatility himself, he could not tolerate a rival.

Posterity does not always see us in the light in which we see ourselves; for if it be true that the fittest survives, it is not always that part of ourselves which we regard as the fittest. A man may reflect with pride upon achievements which he may reckon important scientific discoveries, but nature may reject his facts, and select only his method, just as in the practical world actions are so often rejected, while the character alone survives. If Galen were among us to-day, what portions of his work would he expect to find still

living and praised by the modern world? His anatomical discoveries? Here the verdict of posterity would be on his side, for the soundness of much of his anatomical work is undeniable. Or his physiology? Here, again, the verdict would not be against him; but it would select for approval the simpler portions of his biological work, to the exclusion of those more abstruse speculations on the ultimate constitution of the body, which, however important they seemed to him, are quite as dead as the views of his opponents.

Then he would probably put in a claim for his achievements in medicine. It is a matter of the greatest difficulty to form a true estimate of his work, because the basis of pathology has so completely shifted. His indications are not ours. He necessarily appears in the light of one who by reason of the poverty and scantiness of his instruments is forced to place an undue reliance upon those he has. No modern physician, for example, would dream of making the same use of the pulse as Galen did, for the simple reason that he has much better indications of his own. Nobody at the present day would set out to

write a treatise upon the 'Critical days of fevers,' because we now know that as every fever has a distinct history of its own, and as the crisis is only one event in that history, there can be no use in selecting one fact of this kind, and treating it from an abstract point of view.

His fashionable successes, of which he has left us so complete a record, are of unequal merit. With many of them, including the diagnosis and prognosis of the stomach-ache of Marcus Aurelius, it has fared as with Galen's medical opponents, who have long since gone home to their respective cities, and taken their wages with them.

In conclusion, I shall briefly touch upon two important traits which are discernible in Galen. One is his independence. He held it slavish to belong to any sect. "Call no man master" is a doctrine which may even now be preached with advantage in the medical world of to-day, when people still occasionally seem to think that they have afforded ample justification for some rubbishing paradox, when they have said that they are the pupils of somebody else who holds it.

The second is his simplicity. The acknowledged difficulty of medicine may seem at first

sight hardly reconcilable with the undeniable fact that the sound physician ever carries a simple and intelligible method with him. Yet such is the fact. We have seen Galen playing this off, as it were, against the Roman consultants. But there is no reason to doubt that he really believed in it. To him, as to every other sound physician, belongs the praise of preferring the simple and intelligible to the dark and juggling. And if under the pressure of circumstances the sound physician is occasionally compelled to abandon this simplicity for the moment, and after the fashion of the Delphic oracle of old to contrive riddling answers which come right in any event, yet he will quit his shelter behind the oracular, and return with fondness to the old method again, as soon as the pressure is removed. For in medicine, as well as in ethics, the doctrine is true, "Whatsoever is more cometh of evil."

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